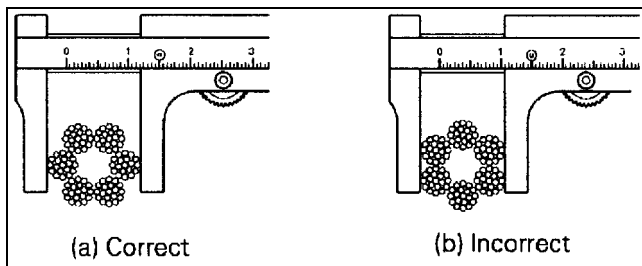


## Chapter 6 Field Acceptance and Installation

### 6-1. Field Acceptance

*a. Measurement of diameter.* The diameter of a wire rope must be measured prior to installation to verify it is as specified and correct for its device, and also to verify it is within the industry tolerance. The industry tolerances per the Wire Rope Technical Board, for wire ropes over 8.0 mm (5/16 in.) are -0 and +5 percent of nominal diameter. Note that new ropes are usually larger than their published diameters, and as stated above, should never be smaller. Diameter shall be measured with the rope loaded between 10 and 20 percent of nominal strength. Figure 6-1 indicates the proper method of measuring diameter.



**Figure 6-1. The diameter of a wire rope is defined as the diameter of its circumscribing circle. Six-strand wire rope should be measured across each of the three opposite strands and eight strand wire rope should be measured across each of the four opposite strands. Special techniques must be used for measuring ropes with an odd number of outer strands**

*b. Damage inspection.* Upon receiving the wire rope, it is important to inspect for damaged packaging, dings, and kinks. The inspection should be scheduled with the supplier present. A report of the results should be made upon completion of the inspection.

### 6-2. Storage, Handling, and Unreeling

*a. Long-term storage.* If wire rope must be stored for long periods, it should be in a well-ventilated, weatherproof building or storage shed. If stored on

wooden spools in humid areas with low light and poor air circulation, damage from microbiologically influenced corrosion may occur. Wire rope should never be stored outdoors.

*b. Handling/unreeling.* Wire rope is wound on reels for shipping at the manufacturer's facility in the same direction as it bends during manufacturing. This bending direction is an inherent feature of the rope. It must be unreeled from its shipping reel and be installed onto its equipment, only bending in this same direction. Reverse bending may cause the rope to become "twisty." It is best to keep wire rope under tension when handling to avoid it becoming looped. Pulling on a loop may result in kinks, permanently damaging the rope. The Wire Rope Users Manual recommends a number of techniques for wire rope handling to avoid reverse bending and kinking.

### 6-3. Installation

The following paragraphs present guidance on wire rope installation. Requirements for installation should be presented in the specifications. It is also recommended that the specifications require an installation plan as a submittal.

*a. Field tensioning of multi-line hoists.* It is important to achieve equal tensioning in a gate-operating device which uses several ropes in parallel. The rope(s) having the higher tension will carry more load and are likely to wear and/or fatigue more rapidly than the others. When ropes are replaced, it is recommended that all ropes be replaced. Replacement of one or some of the ropes is not generally practical for two reasons. First, keeping the old and new ropes in equal tension would be a difficult. The new ropes tend to stretch more quickly than the old ropes, causing the old ropes to carry a greater share of the total load. Frequent tensioning would be required to alleviate this problem. Second, when ropes are replaced piecemeal, installation costs would be greater over the life of the project. Appendix E includes information on the rope tensioning devices.

*b. Drum attachment.* Grooved, plain, and layered drums each require the adherence to certain rules when attaching/installing wire rope.

(1) Grooved drums. The rope must be wound under adequate and continuous tension, and must follow the groove, or it will be cut and crushed where it crosses. Two dead wraps are mandatory, and three are preferable.

(2) Plain drums. The rope must be wound under adequate and continuous tension, and each wrap must be guided as close to the preceding wrap as possible, so there are no gaps between turns. Two dead wraps are mandatory, and three are preferable.

(3) Layered drums. The rope must be wound under adequate and continuous tension. Two dead wraps are mandatory, and three are preferable.

*c. Dynamometer tests.* A dynamometer test monitors wire rope tension during operation of its

gate-operating device. The test link is normally mechanical. This test verifies that the rope is not subjected to higher tension than intended. Information on dynamometer test links is included in Appendix E.

*d. Break-in procedure.* In addition to following the above procedures, it is best if wire rope is "broken in." Ideally, a light load and a slow speed would be used while the operating device is cycled through a few operations. However, in most gate-operating devices, both the load and speed are fixed. The device should be cycled a few times while a number of personnel are stationed in positions to verify that the rope runs freely through all drums, sheaves, and guides.